

## REMARKS

Applicants respectfully request reconsideration of this application as amended. Claims 1-42 remain in this application. Claims 10, 16, 25, 31, and 37 have been amended. No new claims have been added or canceled.

### Rejections under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claims 16-30 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner asserts that the limitation in claim 16 of “wherein the topology of each of said plurality of access nodes is different than others of said plurality of access nodes” is not adequately described in the specification. Applicant respectfully disagrees. For example, see Figures 3A-3C, paragraphs 0063-0068, and paragraph 0070. By way of illustration, Figures 3A-C “illustrate conversion free service level topologies in the form of trees having N1 as the root with branches representing links from node to node through the network.” (See Figures 3A-C, paragraph 0063).

Furthermore, the Examiner asserts that the limitation in claim 25 of “wherein the database is different than other access nodes to be coupled in the wavelength division multiplexing optical network” is not adequately described in the specification. Applicant respectfully disagrees. For example, see Figures 3A-3C, paragraphs 0063-0068, and paragraph 0070. By way of illustration, each access node “may store network topology database(s) representing: service level topologies for the network, service level topologies for that node, and/or conversion free service level topologies for that node.” (See paragraph 0070).

For at least the reasons above, and that the dependent claims depend from an allowable claim, Applicant respectfully submits that claims 16-30 comply with the written description requirement. Accordingly, Applicant respectfully request the that the Examiner remove the 35 U.S.C. § 112, first paragraph rejection

### Rejections under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 37-42 under 35 U.S.C. § 112, first paragraph, as being indefinite. In particular, the Examiner asserts that machine-readable medium claim 37 is an apparatus claim that has method claim limitations. Furthermore, the Examiner cites *In re Lyell*, in support of the position that a claim is indefinite if is both an apparatus claim and a method claims (“A claim ... cannot be both method and apparatus”, *In re Lyell*, 17 U.S.P.Q.2D (BNA), 1548. However, Applicant respectfully submits that machine readable medium claims are product, not apparatus. See MPEP § 2106.01 (I) (“When a computer program is recited in conjunction with a physical structure, such as computer memory, USPTO personnel should treat the claim as a product claim”). The machine readable medium provides a physical structure for the instruction provided by the medium. As such, claim 37 is a product claim, not an apparatus claim. Because claim 37 is a product claim, *In re Lyell* does not apply and the claim is definite.

Furthermore, as claim 37 is a machine readable medium that provide instructions for any machine, USPTO personnel are to examine “the underlying process the computer will perform in order to determine patentability of the product” (“Examination Guidelines for Computer-Related Inventions, Final Version”, p. 11, Patent and Trademark Office, available at [www.uspto.gov/web/offices/pac/dapp/pdf/ciig.pdf](http://www.uspto.gov/web/offices/pac/dapp/pdf/ciig.pdf)). Furthermore, this document recognizes the implicit definiteness of a machine readable medium claim by instructing Examiners how to examine the claim based on the underlying method. Thus, Applicant respectfully submits that the Examiner should examine claim 37 based on the underlying method elements in claim 37.

In addition, the benchmark for indefiniteness is whether one of skill in the art would understand the claim (MPEP 2173.02 “The test for definiteness under 35 U.S.C. § 112, second paragraph, is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification”). Because claim 37 is a machine-readable medium of a type well known to one of skill in the art, one of skill in the art would understand what is claimed in light of the specification.

At least for the reasons cited above, and that the dependent claims depend from a definite claim, Applicant respectfully requests that the Examiner remove the 35 U.S.C. § 112, second paragraph rejection.

Rejections under 35 U.S.C. § 102(a)

Claims 1-5, 8, 10-11, 14, 16-19, 21-22, 24-26, 28, and 30 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Ho et al. (“A Novel Distributed Control Protocol in Dynamic Wavelength-Routed Optical Networks”, IEEE Communications Magazine, November 2002). Applicant does not admit that Ho is prior art and reserves the right to swear behind the reference at a later date. Nonetheless, Applicant respectfully submits that Ho does not disclose each and every element of the invention as claimed in claims 1-5, 8, 10-11, 14, 16-19, 21-22, 24-26, 28, and 30.

Ho discloses selecting an optical path for a source node from many available paths to different destination nodes in an optical network (Ho, Abstract, p.38). The source node is provided with a routing table that defines all possible paths to the different destinations nodes (Ho, p.39, 2<sup>nd</sup> column). The routing table is defined offline (Ho, p. 39, 2<sup>nd</sup> column). Assigning the proper path involves selecting the path and selecting the proper wavelength along the path (Ho, p. 38, 1<sup>st</sup> column). Because all of the routing between the source and destination nodes is predefined in the routing table, path selection just involves wavelength selection (Ho, p. 39, 2<sup>nd</sup> column). Wavelength selection selects the best lightpath between the source and destination nodes (Ho, p. 39, 2<sup>nd</sup> column). This is done by determining critical links (i.e. paths with high traffic), and broadcasting to other nodes to avoid the critical links during path selection (Ho, p. 40, 2<sup>nd</sup> column).

Applicant respectfully submits that Ho does not teach or suggest Applicant's claims. The Examiner equates Applicant's topological database with Ho's routing table. However, Ho discloses that Ho's routing table is defined offline and does not teach or suggest that the optical nodes build or maintain the routing tables. For example, claim 1, as amended, requires “a plurality of wavelength division multiplexing access nodes of an optical network employing a source based scheme to establish communication paths, each of said plurality of access nodes building and maintaining a set of one or more network topology databases specific to that access node based on a set of one or more connectivity constraints, wherein network topology is the set of paths and wavelengths of possible communication paths from that access node to other nodes, and wherein the wavelengths for each path are the set of wavelengths of each link of that path that are available for establishing lightpaths on that path”.

In addition, claim 10, as amended, requires “a wavelength division multiplexing optical network including a plurality of access nodes each including, for each link connected to the access node, a link channel set representing at least certain wavelengths on that link available for establishing a lightpath, wherein a lightpath is a wavelength and a path, wherein the path of a given lightpath is a series of two or more nodes and links interconnecting them through which traffic is carried by the wavelength of that lightpath, wherein said series of nodes respectively starts and ends with a source node and a destination node, and a database representing conversion free connectivity for the access node to others of said access nodes using the wavelengths in said link channel sets, wherein the access nodes builds and maintains the database specific to the access node and wherein said conversion free connectivity includes the paths and wavelengths of possible lightpaths having the access node as the source node and others of the access nodes as the destination node.”

Furthermore, claim 16, as amended, requires “each of a plurality of access nodes of a wave length division multiplexing optical network, tracking wavelengths for each link of the wave length division multiplexing optical network connected to that access node; each of said plurality of access nodes, building and maintaining a topology based on conversion free connectivity to others of said plurality of said access nodes, wherein the topology of each of said plurality of access nodes is different than others of said plurality of access nodes; and responsive to a request for a communication path received by any one of said plurality of access nodes, that access node, selecting both a path through a set of one or more links of said optical network and a single wavelength available on everyone of said set of links based on said topology maintained in that access node, and causing allocation of said selected path and wavelength.”

Claim 24, as amended, requires “...a database to store a representation of available paths from the access node to others of said access nodes using the wavelengths in said link state database, wherein a path is a series of two or more nodes connected by links on which a common set of one or more wavelengths is available for establishing one or more lightpaths, wherein the database is different than other access nodes to be coupled in the wavelength division multiplexing optical network and wherein the access node builds and maintains the database ...”

The above quoted limitations are not described or suggested by Ho. While there are various uses for the invention as claimed, several such uses are discussed at paragraphs 0073-0086. Thus, while the invention is not limited to the uses discussed on these pages, it should be understood that Ho does not enable these uses and the above quoted limitations do.

For at least these reasons, Applicant respectfully submits that the claims discussed above are allowable. The Applicant respectfully submits that the additional dependant claims are allowable for at least the reason that they are dependent on an allowable independent claim.

#### Rejections under 35 U.S.C. § 103(a)

Claims 6-7, 12-13, 20, and 27 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Ho and Golmie et al., “A Differentiated Optical Services Model for WDM Networks” (hereinafter “Golmie”). Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claims 6-7, 12-13, 20, and 27.

Golmie discloses Golmie discloses “a QoS service model in the optical domain ... based on a set of optical parameters that captures the quality and reliability of the optical lightpath.” (Golmie, Abstract.) An optical lightpath being “an optical communication channel, traversing one or more optical links, between a source-destination pair.” (Golmie, Page 69, Left column.) An optical resource allocator handles the dynamic provisioning of lightpaths...” (Golmie, Page 72, Left column.) Golmie does not describe what type of databases are used, the content of these databases, or where a network topology database may be stored.

Applicant respectfully submits that the combination of Ho’s access nodes with Golmie’s QoS service model would not teach or suggest Application invention as claimed in claims 6-7, 12-13, 20 and 27. Claims 6-7, 12-13, 20 and 27 depend on independent claims 1, 10, 16, and 25. Independent claims 1, 10, 16, and 25 are directed towards building and maintaining a topology database (see above). Furthermore, as per above, Ho does not teach or suggest building and maintaining a topology database. In addition, because Golmie does not teach or suggest the type or content databases used,

Golmie cannot teach or suggest an access node building and maintaining a topology database. Therefore, Applicant respectfully submits that the combination of Ho and Golmie do not render claims 1, 10, 16, and 25 obvious and claims 6-7, 12-13, 20, and 27 that depend from them.

Claims 9, 15, 23, and 29 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Ho and Pulkkinen et al., U.S. Pat. Pub. No. 2003/0172356. Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claims 9, 15, 23, and 29.

Pulkkinen discloses centrally managing a distributed database through an object oriented interface (Pulkkinen, paragraph 0012). A gateway is provided between the distributed database system and the clients managing the objects in the system (Pulkkinen, paragraph 0013). The distributed database system is used by service management points to manage services implemented on an intelligent network, such implementing a private telephone exchange over a virtual private network (Pulkkinen, paragraphs 0002, 0019). Nonetheless, Pulkkinen does not disclose a network topology database.

Applicant respectfully submits that the combination of Ho's access nodes with Pulkkinen's central database management would not teach or suggest Applicant's claims 9, 15, 23, and 29. Claims 9, 15, 23, and 29 depend on independent claims 1, 10, 16, and 25, respectfully. Independent claims are directed towards building and maintaining a topology database (see above). Furthermore, as per above, Ho does not teach or suggest building and maintaining a topology database. In addition, because Pulkkinen does not teach or suggest a network topology database, Pulkkinen cannot teach or suggest an access node building and maintaining a topology database. Therefore, Applicant respectfully submits that the combination of Ho and Pulkkinen do not render claims 1, 10, 16, and 25 obvious and claims 9, 15, 23, and 29 that depend from them.

Claims 31-34 and 36 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Ho and Sichani et al. ("A Novel Distributed Progressive Reservation Protocol for WDM All-Optical Networks, IEEE International Conferences Communication, ICC '03,

11-14 May 2003). Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claims 31-34 and 36.

Sichani discloses a progressive reservation protocol for establishing lightpaths in a wave division multiplex all-optical network (Sichani, Abstract). Based on an existing topology, two basic types of reservation protocols can be used to reserve lightpaths: a forward reservation protocol and a backwards reservation protocol (Sichani, p. 1463, 2<sup>nd</sup> column). In a forward reservation protocol, the source node decides on a route to the destination node and initiates a reservation (Sichani, p. 1463, 2<sup>nd</sup> column). The source node sends out a forward reservation signal to reserve a selected wavelength on all links along the desired path (Sichani, p. 1463, 2<sup>nd</sup> column). On the other hand, in a backwards reservation protocol, the source node sends a probe packet towards the destination node gathering information about available wavelengths (Sichani, p. 1463, 2<sup>nd</sup> column). When the probe packet reaches the destination node, the destination nodes selects one of the available wavelengths by reserving the inverse path back to the source node (Sichani, p. 1463, 2<sup>nd</sup> column – p. 1464, 1<sup>st</sup> column). The progressive reservation protocol is a modified backwards reservation protocol, where an interval time is defined that restricts sending successive reservation packets (Sichani, p. 1463, 2<sup>nd</sup> column – p. 1464, 1<sup>st</sup> column). Nonetheless, because Sichani is directed towards reserving paths, Sichani does not disclose building and maintaining a network topology database.

Applicant respectfully submits that the combination of Ho's access nodes with Sichani's backwards reservation protocol would not teach or suggest Applicant's claims 31-34 and 36. The combination would have the access nodes reserving lightpaths with a progressive reservation protocol using a routing table that is defined offline. However, the combination does not disclose the access nodes building and maintaining topological database. For example, claim 31, as amended, requires, "building and maintaining a database representing specific to an access node based on a set of one or more connectivity constraints; receiving, at the access node of an wave division multiplexing optical network, demand criteria representing a request for a communication path; selecting a path and a wavelength on said path using the database for that node that is stored in said access node and that stores a representation of available paths and wavelengths from the access node to others of said access nodes in said optical network,

wherein each path is a series of two or more nodes connected by links on which a common set of one or more wavelengths is available for establishing one or more lightpaths ...”.

The above quoted limitations are not described or suggested by Ho or Sichani. While there are various uses for the invention as claimed, several such uses are discussed at paragraphs 0073-0086. Thus, while the invention is not limited to the uses discussed on these pages, it should be understood that Ho and/or Sichani does not enable these uses and the above quoted limitations do.

For at least these reasons, Applicant respectfully submits that the claim 31 above is allowable. The Applicant respectfully submits that the additional dependant claims are allowable for at least the reason that they are dependent on an allowable independent claim.

Claim 35 stands rejected under 35 U.S.C. § 103(a) as being obvious in view of Ho, Sichani, and Golmie. Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claim 35. Claim 35 depends from independent claim 31. Independent claim 31 is directed towards an access nodes building and maintaining topological database. As per above, none of Ho, Sichani, or Golmie teach or disclose access nodes building and maintaining a topological database. Therefore, Applicant respectfully submits that the combination of Ho, Sichani, and Golmie do not render claim 31 obvious and claim 35 that depend from it.

Claims 37-40 and 42 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Ho, Sichani, and Freeman et al. (“Telecommunications System Engineering”, John Wiley & Sons, 1980, pp. 199-203). Applicant respectfully submits that the combination does not teach each and every element of the invention as claimed in claims 37-40 and 42.

Freeman discloses to store method steps as program memory for providing instructions to a controller or computer.

Applicant respectfully submits that the combination of Ho’s access nodes, Sichani’s backwards reservation protocol, and Freeman’s program memory would not



teach or suggest Applicant's claims 37-40 and 42. The combination would have the access nodes reserving lightpaths using a routing table that is defined offline, where the program is stored in memory. However, the combination does not disclose the access nodes building and maintaining topological database. For example, claim 37, as amended, requires, "... building and maintaining a database representing specific to an access node based on a set of one or more connectivity constraints; responsive to receiving, at [[an]] the access node of an wave division multiplexing optical network, demand criteria representing a request for a communication path, selecting a path and a wavelength on said path using [[a]] the database for that node that is stored in said access node and that stores a representation of available paths and wavelengths from the access node to others of said access nodes in said optical network, wherein each path is a series of two or more nodes connected by links on which a common set of one or more wavelengths is available for establishing one or more lightpaths ..."

The above quoted limitations are not described or suggested by Ho, Sichani. Or Freeman. While there are various uses for the invention as claimed, several such uses are discussed at paragraphs 0073-0086. Thus, while the invention is not limited to the uses discussed on these pages, it should be understood that Ho, Sichani, and/or Freeman does not enable these uses and the above quoted limitations do.

For at least these reasons, Applicant respectfully submits that the claim 31 above is allowable. The Applicant respectfully submits that the additional dependant claims are allowable for at least the reason that they are dependent on an allowable independent claim.

*Invitation for a telephone interview*

The Examiner is invited to call the undersigned at 408-720-8300 if there remains any issue with allowance of this case.

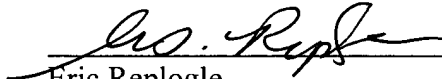
*Charge our Deposit Account*

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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Eric Replogle  
Reg. No. 52, 161

12400 Wilshire Boulevard  
Seventh Floor  
Los Angeles, California 90025-1026  
(408) 720-8300